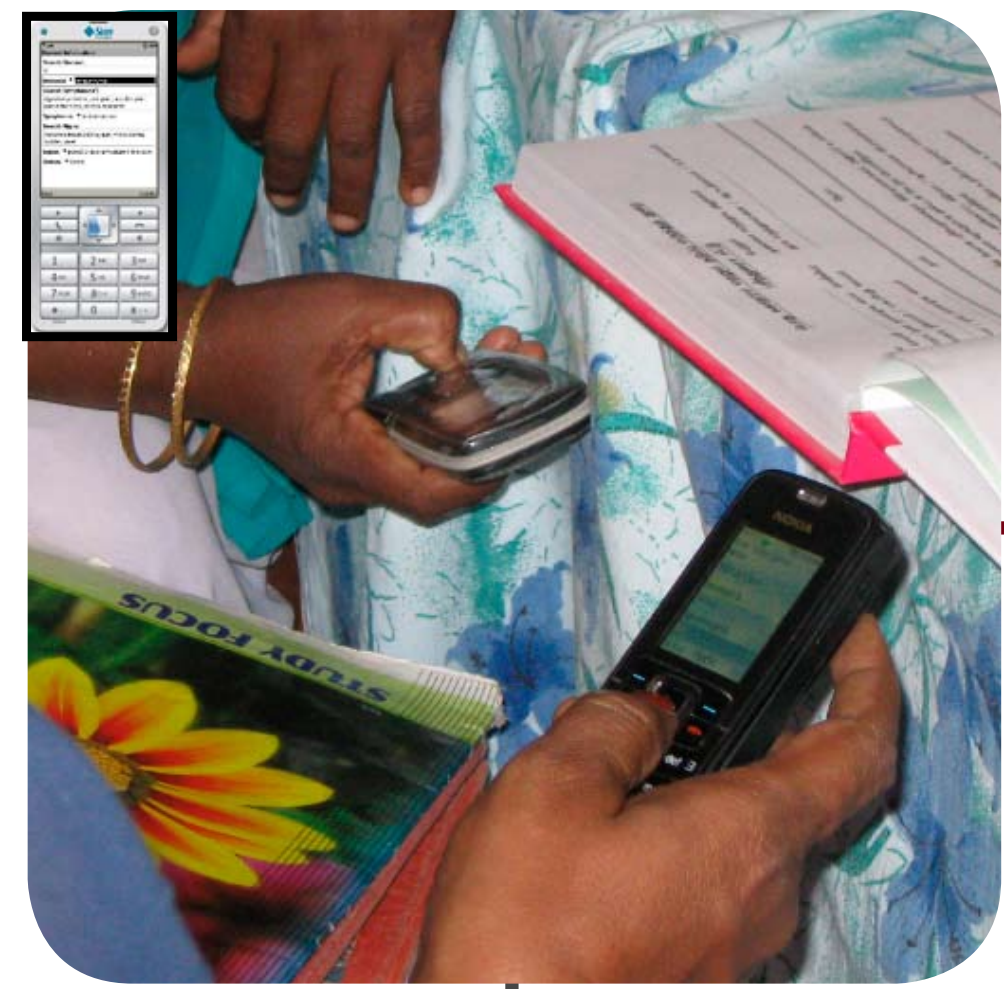


Real-Time Biosurveillance Program

Findings from the pilot research in India and Sri Lanka

RESEARCH QUESTION:

“Can software programs that analyze health statistics and mobile phone applications that send and receive health information be effective in the early detection and mitigation of disease outbreaks?”



Health workers digitize health records via **mHealthSurvey** mobile application

GSM NETWORK



Epidemiologists analyze data with **T-Cube Web Interface**

GSM NETWORK

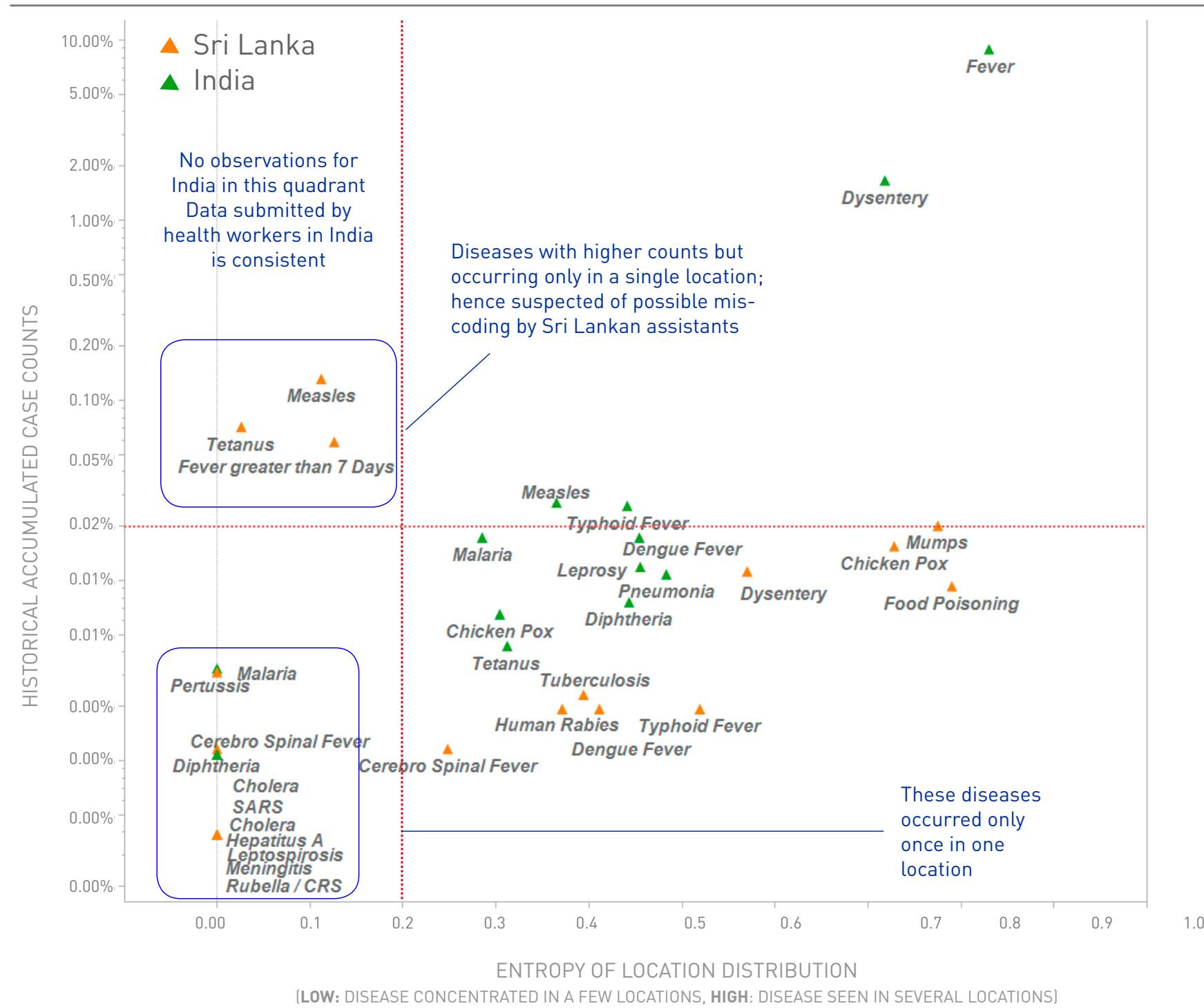


Epidemiologists issue alerts to health worker's phones using **Sahana Alerting Broker**

DATA COLLECTION

mHealthSurvey is a data entry software that works on any standard java-enabled mobile phone. A typical record contains the patient visitation date, location, gender, age, disease, symptoms, and signs. Data is transmitted over GPRS cellular networks.

Observed Discrepancies of Data Digitization



Fever greater than 7 days concentrated in February and March of 2010, mainly from a single location is a data coding error.

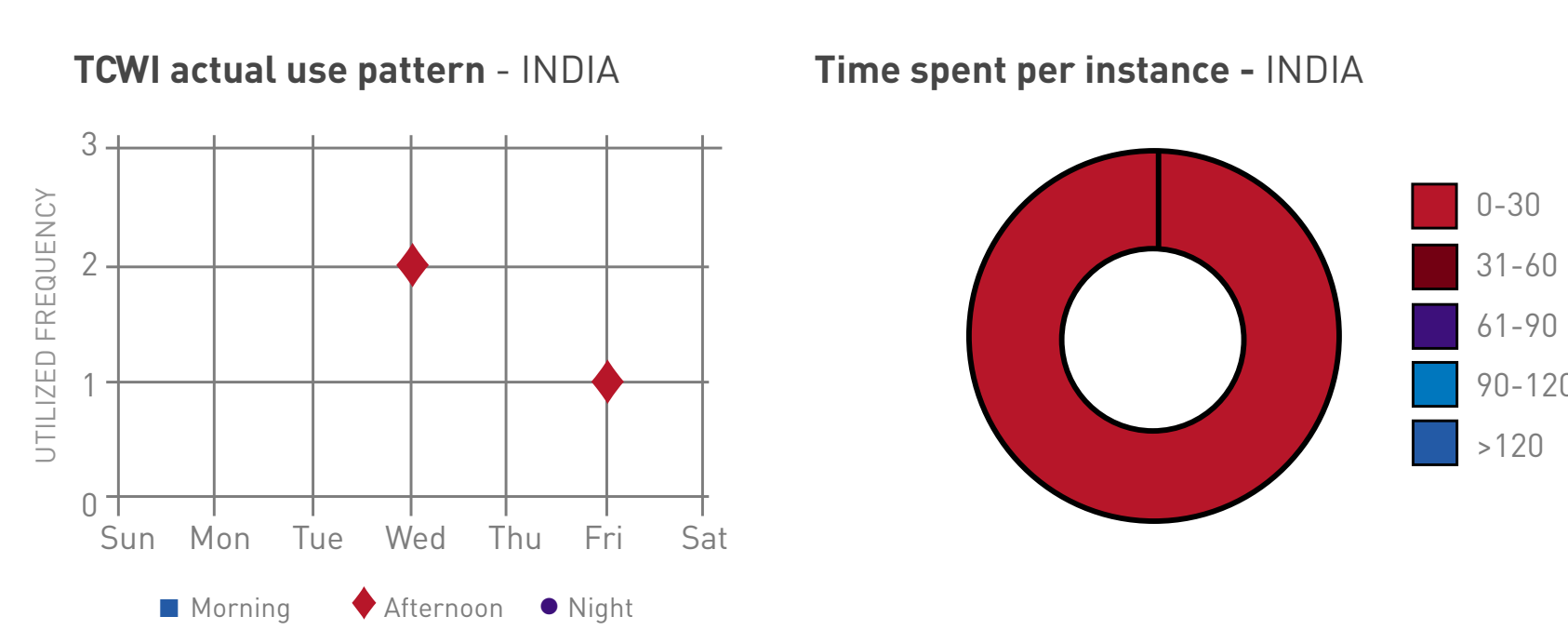
The likelihood of a measles outbreak emerging only in a single location without spreading to other areas, given that it is a viral disease, is highly unlikely.

The assistant entering the data had submitted data for "Toxide vaccine" as Tetanus.

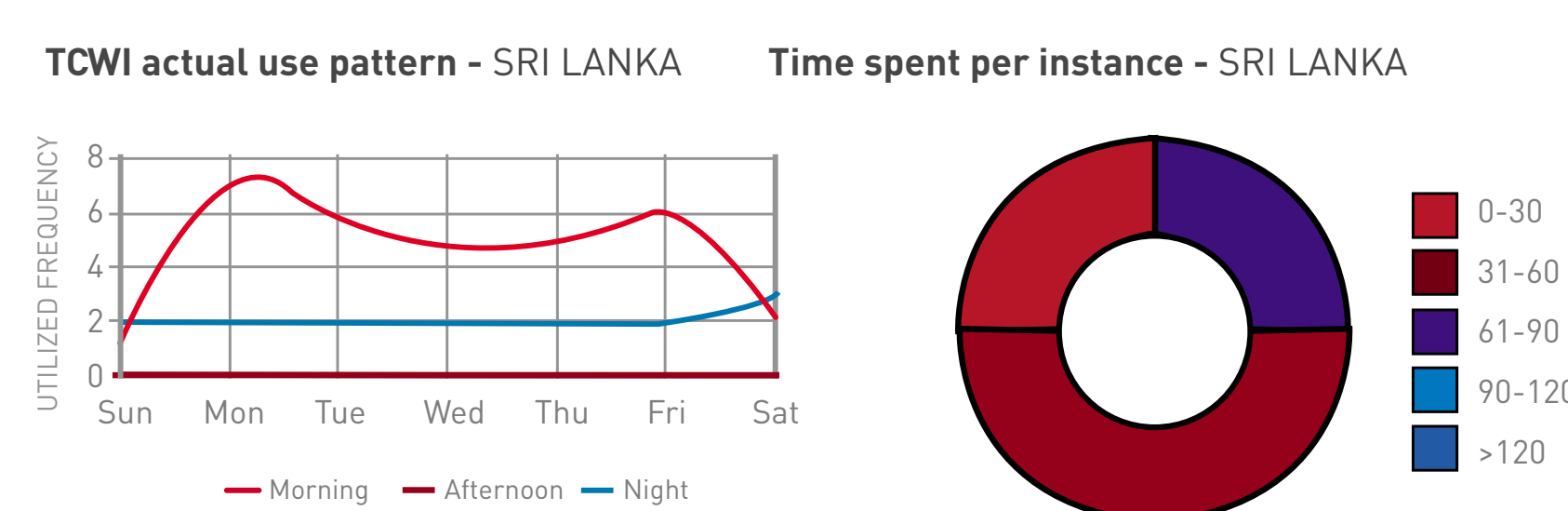
EVENT DETECTION

T-CubeWeb Interface (TCWI) is an Internet browser-based tool to visualize and manipulate large spatio-temporal datasets. Epidemiologists can pin down a potential outbreak of for instance, acute gastro-enteritis disease among children in the Sevanipatti PHC health division.

T-Cube Web Interface: Actual Usage by Health Departments



3 of 14 potential users spend less than 30 minutes each time once a week on detection analysis.



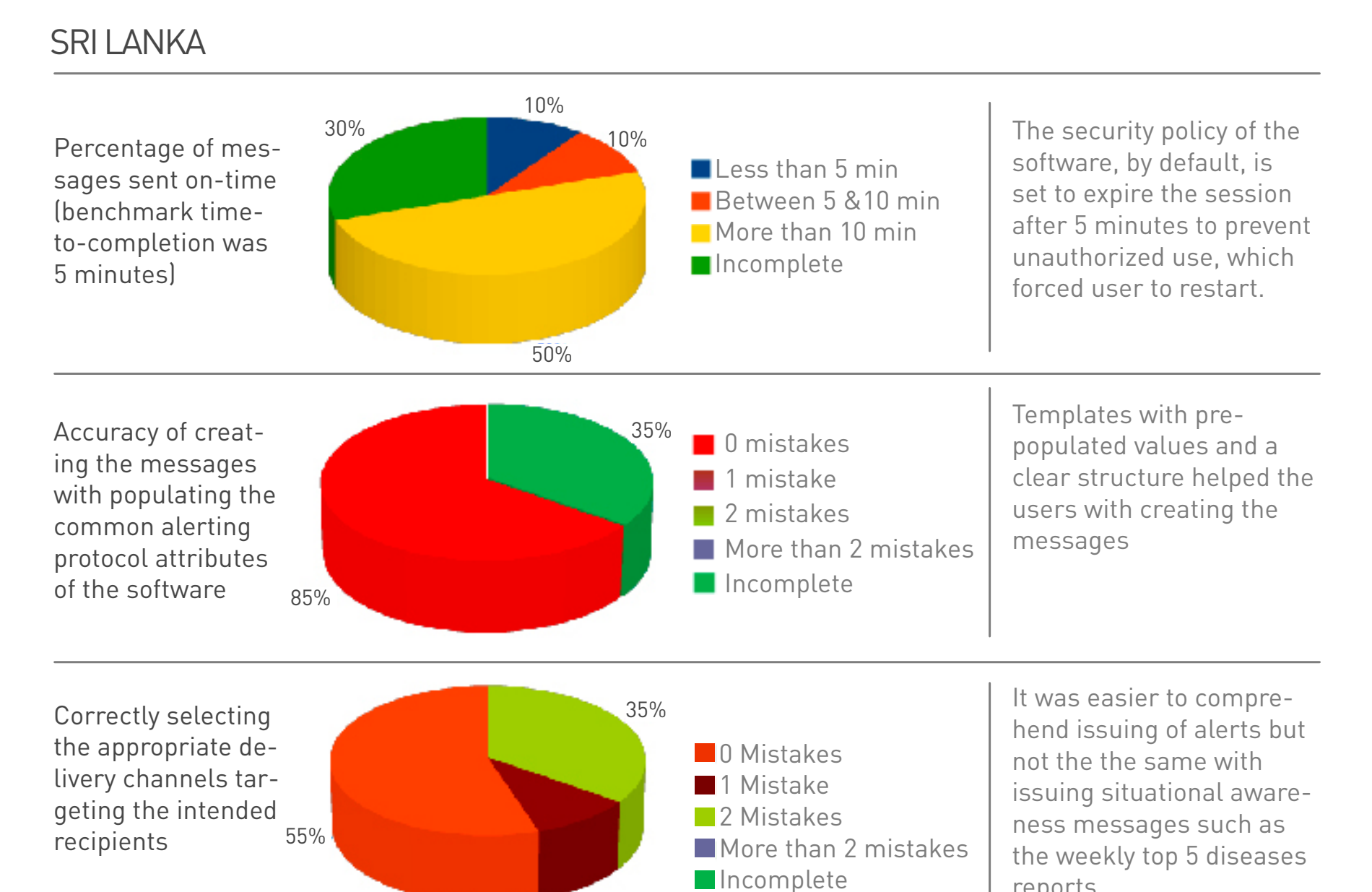
Sri Lanka all 9 users spend more than 30 minutes each time every day of the week on detection analysis.

ALERTING

Sahana Alerting Module (SAM) allows for the generic dissemination of localized and standardized interoperable messages. Selected groups of recipients would receive the single-entry of the message via SMS, Email, and the Web.

Messaging Exercises with Sahana Alerting Broker

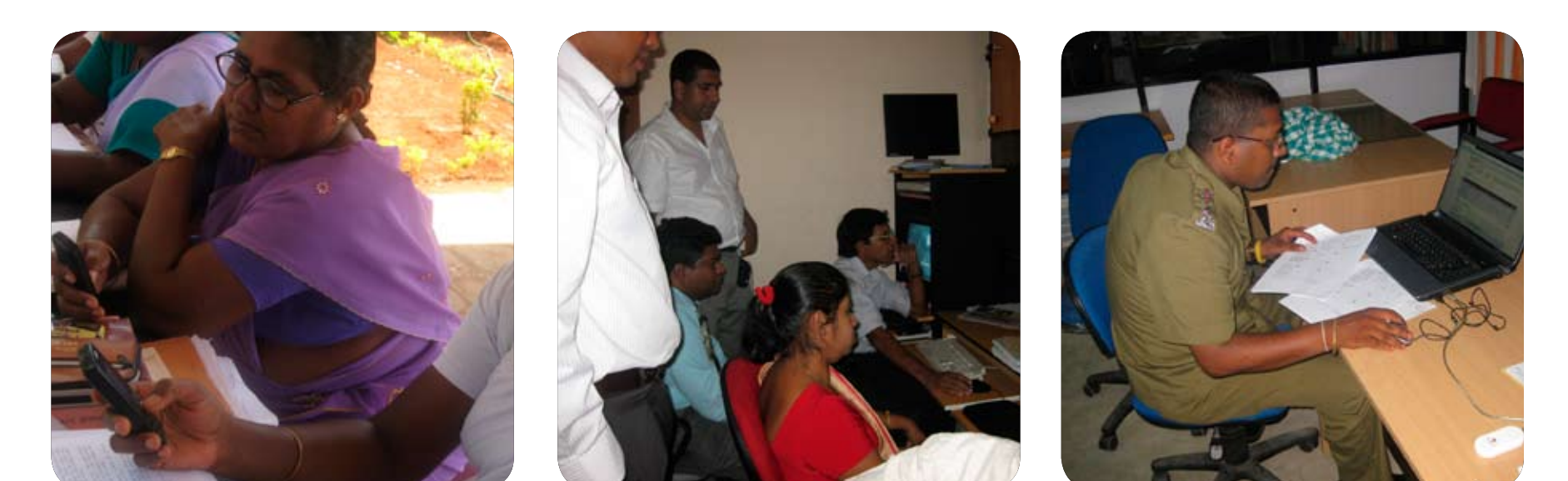
3 users in India and 5 users in Sri Lanka participated in the message dissemination exercises. Each user was presented with four varying scenarios in relation to escalating cases of diseases identified through TCWI and other sources.



The security policy of the software, by default, is set to expire the session after 5 minutes to prevent unauthorized use, which forced user to restart.

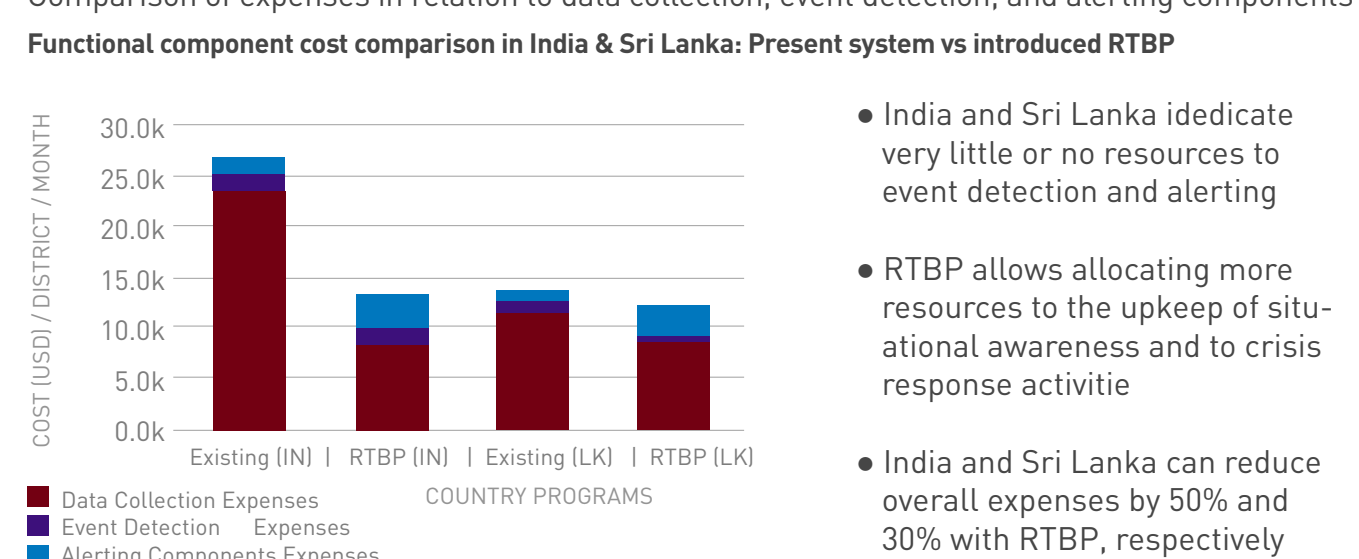
Templates with pre-populated values and a clear structure helped the users with creating the messages

It was easier to comprehend issuing of alerts but not the same with issuing situational awareness messages such as the weekly top 5 diseases reports.

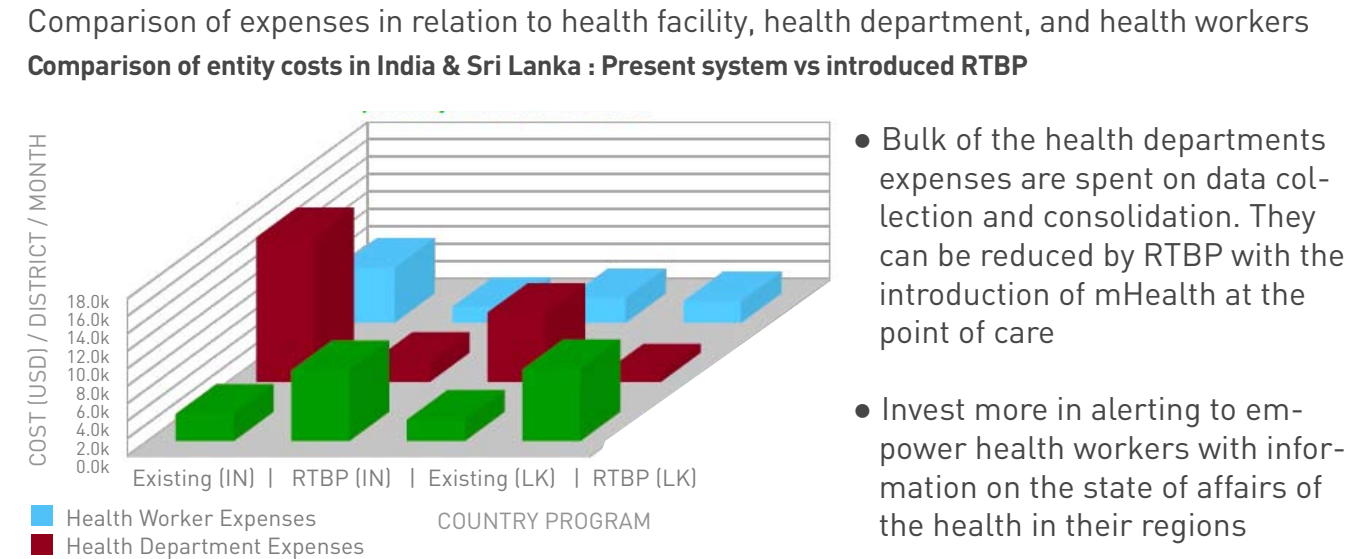


Distribution of Expenses

Comparison of expenses in relation to data collection, event detection, and alerting components



Comparison of expenses in relation to health facility, health department, and health workers



Existing (INI) = present system in India (Integrated Disease Surveillance Program); Existing (ILKI) = present system in Sri Lanka (Disease Surveillance and Notification Program); RTBP (INI), RTBP (ILKI) = Real-Time Biosurveillance Program in India and Sri Lanka, respectively.

COST EFFECTIVENESS

The implementation of this new system will lead to savings of a minimum of 30 and 50 percent in Sri Lanka and India, respectively, compared to the existing system by reducing data collection costs, with additional indirect savings made by the elimination of existing paper and labor intensive process. The biosurveillance system will be capable of detecting all outbreaks, rather than just notifiable ones as in the current system.

CONCLUSION

“This kind of system can result in safer and healthier communities, by empowering public health managers and introducing efficiencies into the prevention and mitigation of ever-escalating challenges to public health.”

For more information and downloads: <http://lirneasia.net/projects/2008-2010/evaluating-a-real-time-biosurveillance-program>